# City University of Hong Kong
## Course Syllabus

### offered by Department of Architecture and Civil Engineering
### with effect from Semester A 2024 / 2025

## Part I    Course Overview

| | |
|---|---|
| **Course Title:** | Theory of Plates and Shells |
| **Course Code**: | CA8007M |
| **Course Duration:** | 1 Semester<br>(Some courses offered in Summer Term may start a few weeks earlier than the normal University schedule. Please check the teaching schedules with CLs before registering for the courses.) |
| **Credit Units**: | 3 |
| **Level**: | R8 |
| **Medium of Instruction:** | English |
| **Medium of Assessment:** | English |
| **Prerequisites**:<br>*(Course Code and Title)* | Nil |
| **Precursors**:<br>*(Course Code and Title)* | Nil |
| **Equivalent Courses**:<br>*(Course Code and Title)* | BC8007M Theory of Plates and Shells |
| **Exclusive Courses**:<br>*(Course Code and Title)* | Nil |

## Part II    Course Details

### 1.    Abstract

The course provides enhanced knowledge in solid mechanics and advanced structural mechanics.

### 2.    Course Intended Learning Outcomes (CILOs)

| No. | CILOs | Weighting (if applicable) | Discovery-enriched curriculum related learning outcomes (please tick where appropriate) | | |
|---|---|---|---|---|---|
| | | | *A1* | *A2* | *A3* |
| 1. | discover and exploit various modelling avenues for structural engineering components and obtaining exact and/or approximate solutions; | | ✓ | ✓ | |
| 2. | enrich research capability in plates and shells; and | | | ✓ | ✓ |
| 3. | apply the theory of plates and shells in engineering designs. | | | | ✓ |
| | | 100% | | | |

A1:   *Attitude*
   *Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.*

A2:   *Ability*
   *Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.*

A3:   *Accomplishments*
   *Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.*

## 3. Learning and Teaching Activities (LTAs)

| LTA | Brief Description | CILO No. | | | | Hours/week |
|-----|-------------------|---|---|---|---|------------|
| | | 1 | 2 | 3 | 4 | (if applicable) |
| Lectures | Introducing theory, concepts and problem solving | ✓ | ✓ | ✓ | ✓ | |
| Tutorials | Introducing theory, concepts and problem solving | ✓ | ✓ | ✓ | ✓ | |

| | |
|---|---|
| Semester Hours: | 3 hours per week |
| Lecture/Tutorial/Laboratory Mix: | Lecture (Mix); Tutorial (Mix); Laboratory (-) |
| | 3 hours per week including lectures and tutorials |

## 4. Assessment Tasks/Activities (ATs)

| Assessment Tasks/Activities | CILO No. | | | Weighting | Remarks |
|-----------------------------|---|---|---|-----------|---------|
| | 1 | 2 | 3 | | |
| Continuous Assessment: 100% | | | | | |
| Tests and /or assignments | ✓ | ✓ | ✓ | 100% | |
| Examination: 0% | | | | | |
| | | | | 100% | |

## 5.   Assessment Rubrics

Applicable to students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter

| Assessment Task | Criterion | Excellent (A+, A, A-) | Good (B+, B, B-) | Fair (C+, C, C-) | Marginal (D) | Failure (F) |
|---|---|---|---|---|---|---|
| Tests and /or assignments | CAPACITY for SELF-DIRECTED LEARNING to understand the principles of plates and shells | High | Significant | Moderate | Basic | Not even reaching marginal levels |

Applicable to students admitted from Semester A 2022/23 to Summer Term 2024

| Assessment Task | Criterion | Excellent (A+, A, A-) | Good (B+, B) | Marginal (B-, C+, C) | Failure (F) |
|---|---|---|---|---|---|
| Tests and /or assignments | CAPACITY for SELF-DIRECTED LEARNING to understand the principles of plates and shells | High | Significant | Basic | Not even reaching marginal levels |

**Part III   Other Information**

**1.   Keyword Syllabus**

Variational principles: strain energy, Lagrange method, Ritz method, Galerkin method, Levy's method, Kantorovich method.
Rectangular plates: bending of plates, simply supported plates, Navier solution, clamped plates, vibration and buckling of plates. Circular plates: plates in polar coordinates, simply supported and clamped circular plates, vibration and buckling of circular plates. Theory of shells, cylindrical shells, shallow and deep shells. Symplectic method for plates and shells.

**2.   Reading List**

**2.1   Compulsory Readings**

| 1. | Nil |
|----|-----|

**2.2   Additional Readings**

| 1. | A.C. Ugural, Stresses in Plates and Shells, McGraw-Hill International Edition, 1999. ISBN: 0-07-116793-5. |
|----|------|
| 2. | S. Timoshenko and S. Woinowsky-Kreiger, Theory of Plates and Shells, McGraw-Hill Education, 1969, ISBN: 0070858209. |
| 3. | J.S. Rao, Dynamics of Plates, Narosa Publishing House, 1999, ISBN: 81-7319-250-2. |